

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-35 (cancelled)

Claim 36 (currently amended): A process for the in-situ preparation of a single-site transition metal olefin polymerization catalyst which comprises:

- (a) forming a precatalyst by contacting a boron-containing ionizing agent with a neutral transition metal complex having the formula:



wherein M is a Group 3-10 metal, L is a bulky ancillary anionic polymerization-stable carbocyclic, heterocyclic or constraint-inducing ligand, L* is a bulky ancillary anionic polymerization-stable heterocyclic ligand selected from the group consisting of boraaryl, pyrrolyl, azaboralinyll, quinolinyll, and pyridinyll, x is 1 to 3, y is 1 to 3, x + y is equal to the valence of the metal minus one, and X is selected from the group consisting of halogen, C₁₋₂₀ alkoxy, C₆₋₂₀ aryloxy, and alkyl- or aryl-substituted amido, n is 1 to 4, m is 1 to 4 and n+m is equal to the valence of the metal, M; and

- (b) introducing the precatalyst into a polymerization system and forming an alkylated cationic transition metal catalyst by contacting the precatalyst with an organometallic alkylating agent, wherein the precatalyst and organometallic alkylating agent are contacted in the presence of one or more C₂₋₁₂ α-olefin monomers.

Claim 37 (cancelled)

Claim 38 (original): The process of Claim 36 wherein the molar ratio of boron to transition metal in step (a) is from 0.1:1 to 10:1 and the molar ratio of alkylating agent metal to transition metal in step (b) is from 1:1 to 1000:1.

Claim 39 (original): The process of Claim 36 wherein the boron-containing ionizing agent and the neutral transition metal complex are contacted in an inert hydrocarbon medium.

Claim 40 (original): The process of Claim 36 wherein the boron-containing ionizing agent is a trialkyl borane, triaryl borane or ionic organoborate compound.

Claim 41 (original): The process of Claim 40 wherein M is a Group 4-6 transition metal.

Claim 42 (original): The process of Claim 41 wherein the neutral transition metal complex has the formula



wherein M, L and X are the same as defined above, L* is a bulky ancillary anionic polymerization-stable heterocyclic ligand selected from the group consisting of boraaryl, pyrrolyl, azaboralinyll, quinolinyl, and pyridinyl, x is 1 to 3, y is 1 to 3, x + y is equal to the valence of the metal minus one, and X is halogen.

Claim 43 (original): The process of Claim 36 wherein the organometallic alkylating agent is a Group 2, 12, or 13 metal compound containing at least 1 alkyl group having from 1 to 8 carbon atoms.

Claim 44 (original): The process of Claim 43 wherein the organometallic alkylating agent is selected from the group consisting of dialkyl zincs, dialkyl

magnesiums, alkyl magnesium halides, alkyl aluminum dihalides, dialkyl aluminum halides, and trialkyl aluminums.

Claim 45 (currently amended): A process for the in-situ preparation of a supported single-site transition metal olefin polymerization catalyst which comprises:

(a) combining (1) a neutral transition metal complex having the formula:



wherein M is a Group 3-10 metal, L is a bulky ancillary anionic polymerization-stable carbocyclic, heterocyclic or constraint-inducing ligand, L* is a bulky ancillary anionic polymerization-stable heterocyclic ligand selected from the group consisting of boraaryl, pyrrolyl, azaboralinyll, quinolinyll, and pyridinyll, x is 1 to 3, y is 1 to 3, x + y is equal to the valence of the metal minus one, and X is selected from the group consisting of halogen, C₁₋₂₀ alkoxy, C₆₋₂₀ aryloxy, and alkyl- or aryl-substituted amido, ~~n is 1 to 4, m is 1 to 4 and n+m is equal to the valence of the metal, M;~~ (2) a boron-containing ionizing agent; (3) a support material; and (4) an inert hydrocarbon;

(b) removing all or a portion of the inert hydrocarbon to obtain a supported transition metal precatalyst; and

(c) introducing the supported transition metal precatalyst into a polymerization system and contacting the supported precatalyst with an organometallic alkylating agent to form a supported cationic transition metal catalyst, wherein the supported precatalyst and organometallic alkylating agent are contacted in the presence of one or more C₂₋₁₂ α-olefin monomers.

Claim 46 (cancelled)

Claim 47 (original): The process of Claim 45 wherein the support material is an inorganic oxide, inorganic silicate, inorganic chloride, or organic polymer resin.

Claim 48 (original): The process of Claim **47** wherein the support material is an inorganic oxide selected from the group consisting of silica, alumina, silica-alumina, magnesia, titania, and zirconia.

Claim 49 (previously presented): The process of Claim **48** wherein the inorganic oxide support is pretreated to remove all or a portion of the hydroxyl functional groups present on the surface of the support.

Claim 50 (original): The process of Claim **49** wherein the pretreatment is accomplished by thermal, chemical, or a combination of thermal and chemical means.

Claim 51 (original): The process of Claim **50** wherein the thermal pretreatment is carried out by heating at 150°C to 800°C.

Claim 52 (original): The process of Claim **50** wherein the chemical pretreatment is carried out by contacting the inorganic oxide support with a modifier selected from the group consisting of alumoxanes, alkyl aluminums, alkyl aluminum halides, alkyl aluminum hydrides, alkylsilyl halides, alkylidisilazanes, alkyl and aryl alkoxysilanes, and alkyl, aryl, and alkoxy boron compounds.

Claim 53 (original): The process of Claim **50** wherein substantially all surface hydroxyl functional groups are removed.

Claim 54 (original): The process of Claim **45** wherein the boron-containing ionizing agent is a trialkyl borane, triaryl borane or ionic organoborate compound.

Claim 55 (original): The process of Claim **45** wherein M is a Group 4-6 transition metal.

Claim 56 (original): The process of Claim **45** wherein the organometallic alkylating agent is a Group 2, 12, or 13 metal compound containing at least 1 alkyl group having from 1 to 8 carbon atoms.

Claim 57 (original): The process of Claim **56** wherein the organometallic alkylating agent is selected from the group consisting of dialkyl zincs, dialkyl magnesiums, alkyl magnesium halides, alkyl aluminum dihalides, dialkyl aluminum halides, and trialkyl aluminums.